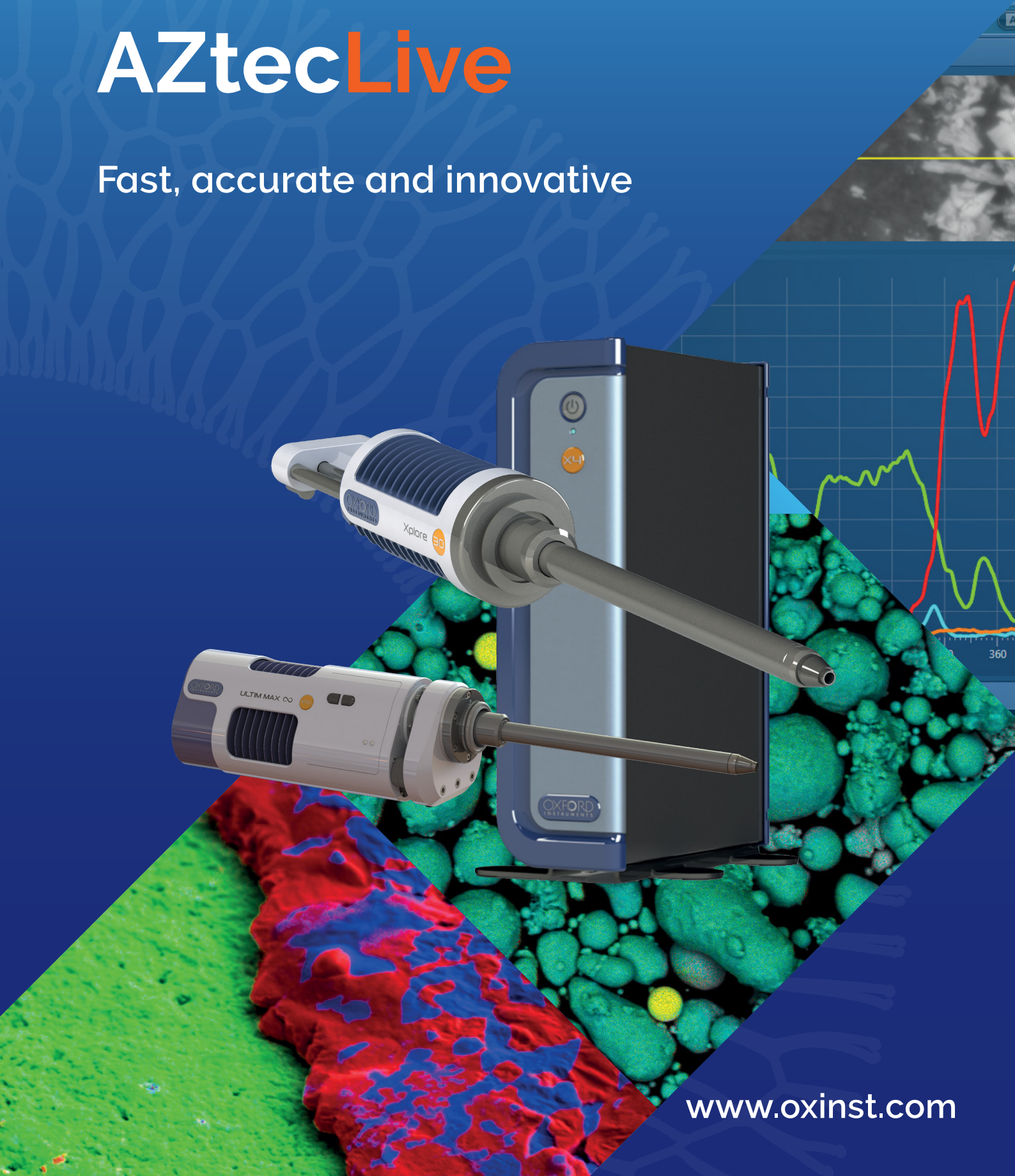
OXFORD INSTRUMENTS

AZtecLive

Fast, accurate and innovative



www.oxinst.com

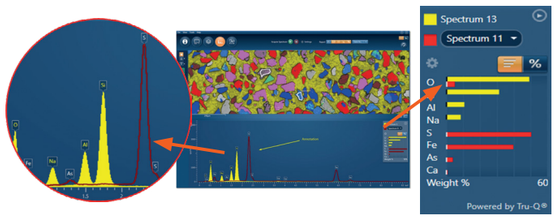
AZtecLive® Software

The AZtecLive software platform combines unrivalled speed and accuracy of results for routine analysis, with the flexibility and power required for more complex applications. A host of tools and technologies will transform the way you get results and enable everyone to see 'The Real Picture'.

- Ground-breaking new technology within Live Chemical Imaging delivers an instantaneous and moving analysis experience for all
- Every facet of AZtecLive has been optimised with speed and productivity in mind, without compromising accuracy and reliability
- Fundamental to AZtecLive are innovative features and novel visualisations that deliver useful information to help you make decisions
- Whatever your level of expertise, AZtecLive will be there to guide you from start to finish or give you the tools to find your own way
- Tru-Q® technology takes AutoID and standardless analysis to the next level and ensures that AZtec gives the best 'out of the box' results

Spectrum Acquisition

Tru-Q enables AZtecLive to deliver instant results



Tru-Q delivering instant quant results and spectrum comparison even during acquisition

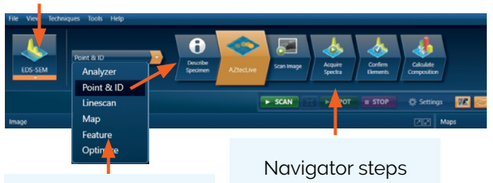
- Acquire spectra from point, rectangular, elliptical and freehand regions
- Compare a spectrum with a previously acquired spectrum, even during acquisition
- No need to wait until acquisition is completed – Quant results shown instantly in the MiniQuant viewer

Guided Mode

Workflows to guide you from acquisition to reporting, enabling you to get accurate results

Technique chooser

- Individual navigators guide you through the required steps to obtain reliable and accurate results



Navigator steps

Navigator chooser

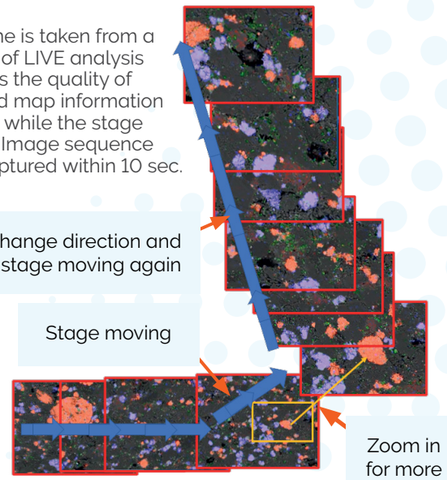
Live Chemical Imaging

Taking sample investigation to the next level

- View morphology and elemental distribution in a single colour image, simultaneously and continuously as you move around your sample.
- Investigate more of your sample faster
- Increase the certainty that you'll find what you're looking for and not miss vital information
- ColourHiQ takes electron and spectrum image data integration to the next level with super fast image data processing

Powered by ColourHiQ

Each frame is taken from a recording of LIVE analysis and shows the quality of image and map information displayed while the stage is moving Image sequence shown captured within 10 sec.



Change direction and stage moving again

Stage moving

Zoom in for more detail on a particle

An example of a normal Live Chemical Imaging workflow

SmartMap X-ray Mapping and Linescanning

SmartMap spectral mapping enables

- All data to be collected at every pixel
- Any element map can be generated at any time (even after data collection)
- Spectra can be reconstructed from any point or area on a SmartMap
- See how all elements are distributed over an area or line
- No sample pre-knowledge required
- Maps and LineScans for all elements identified and generated automatically

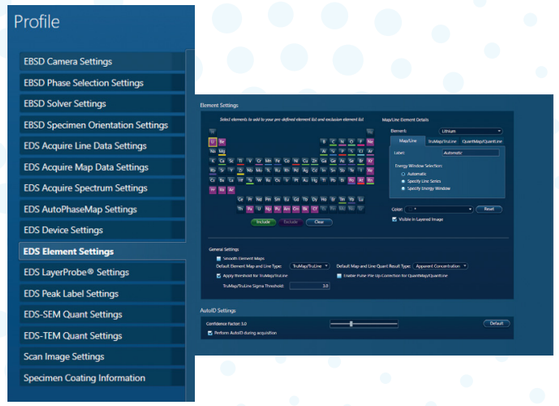
Mapping interface

Limescan interface

User Profiles

Save all your acquisition settings for easy recall

- All acquisition settings (Spectrum, LineScan or Map) can be saved into a user profile.
- This profile can be loaded at anytime in the future and your system is automatically setup and ready to go



Profile folders containing all the settings required to replicate an acquisition

Tru-Q and TruQ IQ

Tru-Q® technology is a fundamental EDS detector calibration measured with a synchrotron, enabling accurate characterisation of each detector type on an SEM. Using this characterisation Tru-Q delivers market leading levels of accuracy and reliability in quantitative analysis, AutoID, peak deconvolution and real-time map correction.

Tru-Q IQ takes things to the next level where each and every Ultim Max Infinity detector is characterised on an SEM during manufacture and then given its own unique detector optimisation. This gives unparalleled performance with every Infinity detector able to characterise accurately the most complex analysis challenges, solve challenging low energy peak overlaps and find smaller concentrations of elements.

	O	Na	Al	Si	K	Ca
4,000 cps	46.68	2.55	9.92	30.56	10.04	0.25
400,000 cps	46.71	2.55	9.89	30.62	9.97	0.27

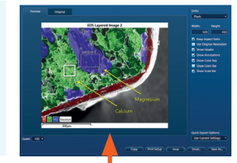
Quant of an Orthoclase standard shows same accurate results whether collecting at 4,000 cps or 400,000 cps

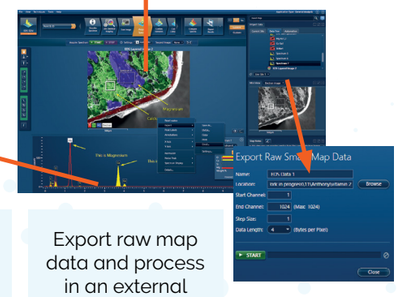
Data Export and Reporting

Report your results the way you want to

- Reporting direct from the interface - a simple right click, and data can be e-mailed direct to your customer
- Dedicated export application, where you can export your data in the format and resolution you want

Powerful export dialogue means you can export images exactly the way you want





Annotate an image, map or spectrum and email

Export raw map data and process in an external program

AZtecLive® Standard

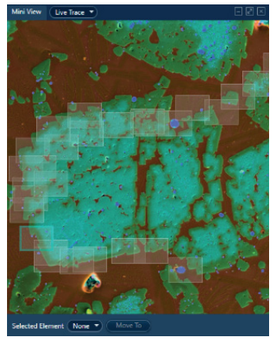
AZtecLiveSTD

Designed for general purpose research, and more demanding quality control and failure analysis applications.

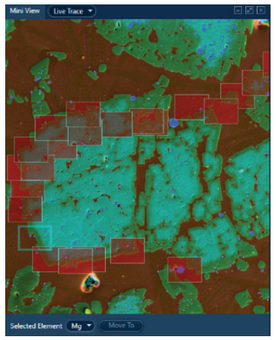
Live Trace

Automatically records which areas on the sample have been visited and what elements have been detected

- View where elements are and their relative concentration
- Quickly find element 'hot spots'
- Relocate to any point on the trace to carry out a more detailed investigation
- Uses the currently registered image as a backdrop to the Live Trace



Grey boxes showing locations visited on sample



Red boxes showing locations of individual elements detected

Stage Move Tool

Gives a powerful and interactive control over an SEM stage

- Available ANYTIME in all navigators
- A simple 'double click' of the mouse on the image, and the microscope stage will move to the new area of interest
- Any number of registered images can be selected within the stage move tool
- Can be pinned so that it is always visible
- Can be undocked and placed on a second monitor
- Ideal for remote working

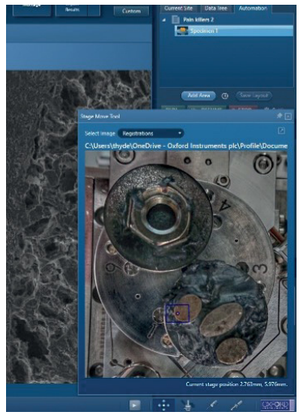


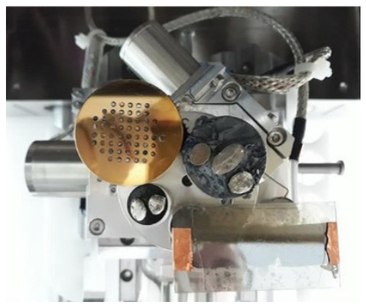
Image registration using an image taken with a mobile phone to control stage movements

Image Registration

Delivering greater control of sample analysis whether on the microscope or working remotely

- Optical photos or Large Area Maps can be used for navigation and relocation – increasing productivity and usability
- AZtec takes control of the microscope stage and seamlessly relocates to points of interest

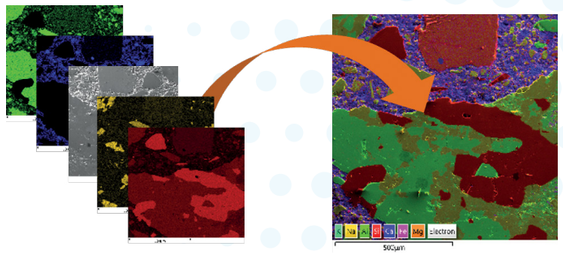
Image of the SEM sample stage loaded with several samples



AutoLayer

Turns the information contained in an electron image and a set of X-ray maps into a single image that highlights the key points

- By identifying and combining the elements that vary in a sample, AutoLayer helps you visualise both phases and element distribution using a single image

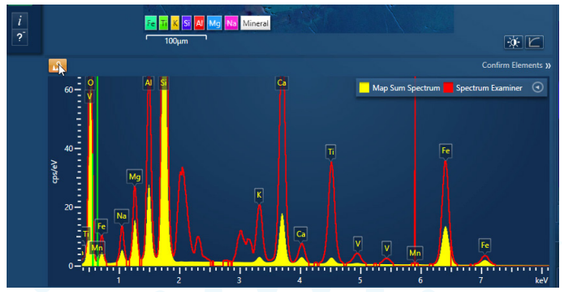


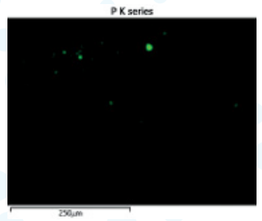
Individual X-ray maps combined with electron image to create a single informative coloured image

Spectrum Examiner

Helping you spot small phases in your sample

- Acquiring X-ray maps is a great way to find out what elements are present in your sample and how they are distributed.
- If there are elements present in very small phases, they can sometimes be dominated by the major elements in the field of view, and as a consequence, they can sometimes be missed
- Spectrum examiner analyses a SmartMap and highlights interesting energy regions in the sum spectrum where there is a significant variation in pixel counts (red overlay). This means that spectrum examiner enables the detection of small phases with high concentrations of an element that would otherwise be overlooked





Spectrum Examiner overlay highlighting possible small peaks that have not been identified in the sum spectrum – In this case the phosphorus peak has been identified and the subsequent map reveals a number of small phosphorus- rich phases

Custom Mode

Delivering the flexibility to work the way you want to

- You decide what functionality you want to see and where you want to see it
- Utilise up to 4 monitors

Up to four monitors can be used in Custom Mode

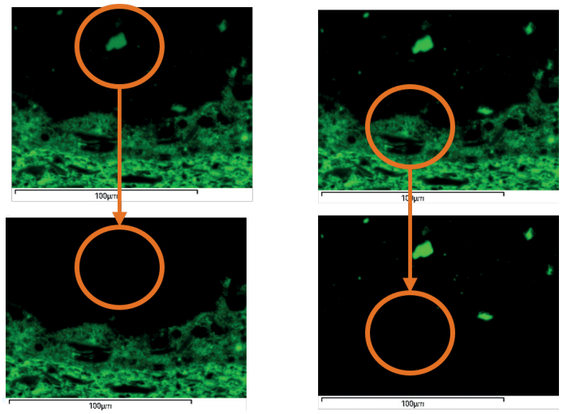
TruMap

Utilising the spectrum processing power of Tru-Q will show the true distribution of elements in your sample

- Corrects for peak overlaps
- Removes artefacts due to background
- TruMaps are calculated in real time

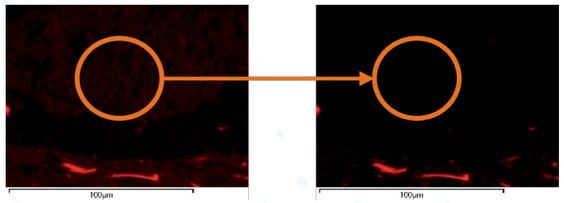
Solves Overlaps - In the paint cross-section example below, you could be forgiven for thinking that the distribution of Ti and Ba are identical. But with TruMap technology, the real Ti and Ba distributions are revealed

Standard X-Ray Maps of Ti and Ba



TruMaps of Ti and Ba

Removes Background - In the same sample, we can see how TruMap also helps with removing artefacts due to background variations. The maps below show the difference in the distribution of Al when going from standard Windows Integral mapping to TruMapping.



AZtecLive® Advanced

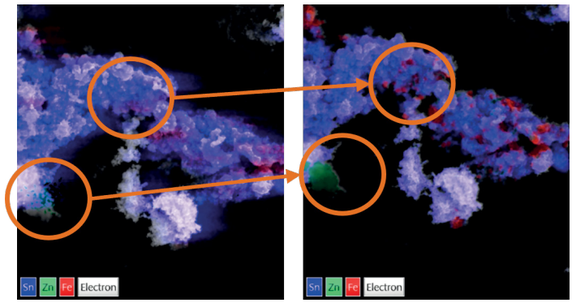
AZtecLiveADV

Designed for applications where data acquisition is challenging or where a greater understanding of a sample is required quickly through automated acquisition or the analysis of large datasets.

AutoLock

Provides a seamlessly integrated and invaluable solution to collecting useful data when specimens drift

- Works in extreme situations, even on the nanoscale
- Unique blend of predictive and reactive drift correction routines cope with different types of specimen drift
- Provides live updates of corrective action
- For high magnification applications where sample drift is an issue, we have a special 'Frame by Frame' drift correction that copes with continuous sample drift



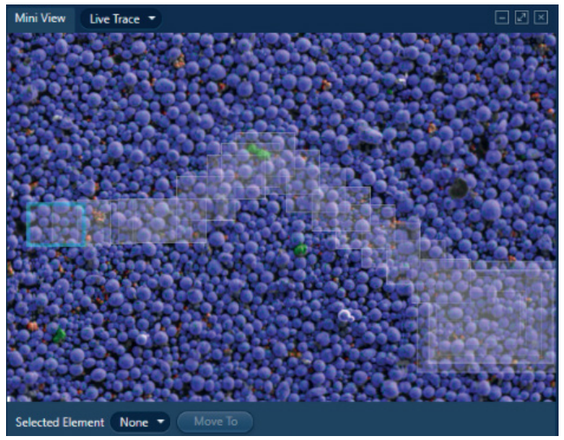
Ceramic powder sample – Fe and Zn phases only visible with drift correction enabled

AZtec Large Area Mapping

Powerful application that quickly creates a chemical and morphological image that can be used for sample navigation or to create a virtual sample that can be analysed off-line, anytime.

Sample Navigation

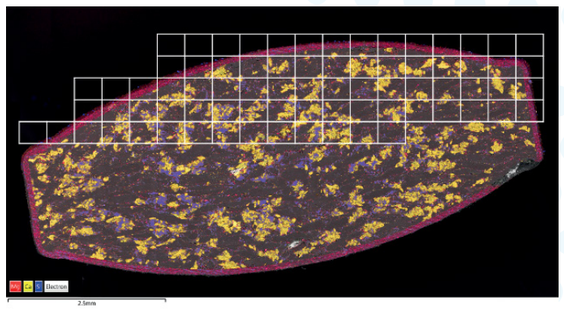
- A quick navigational LAM with both morphological and chemical information can be acquired in minutes
- A single montaged image can be used to navigate around a sample using the 'Stage Move' tool. Double click anywhere on the image and the stage will automatically move to that area
- Can also be used as a backdrop to the Live Trace application within the Live Chemical Imaging step, to see where analysis has been carried out on the sample
- Seeing both morphological and chemistry information enables a much more detailed, informed and productive analysis of a sample to be performed



Live Trace – showing what areas have been visited on the sample

Virtual Sample

- Acquire up to 10,000 fields, each with a max image resolution of 8K x 8K, and X-ray SmartMaps with a max of 4K x 4K
- Montaged image up to 20K x 20K for both image and X-ray SmartMaps
- The montaged image acts as a virtual sample that can be further interrogated at any time; reconstruct spectra, linescans and maps

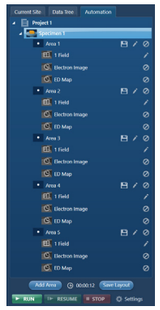


Large Area Map – each individual area is automatically aligned to create a single image and SmartMap

AZtec Point Automation

Enabling individual X-Ray SmartMap/ SmartLine acquisitions at different stage locations to be queued up for unattended analysis

- Each mapping experiment can have different magnification, resolution and dwell time
- Users can set the SEM to perform an Auto focus and Auto brightness & contrast before acquiring commences at each stage location
- Ideal for quality control on large sample sets



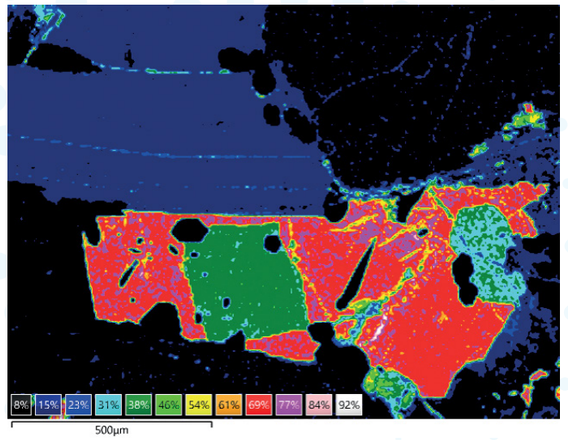
List of queued map acquisitions

QuantMap

Helps to visualise the quantitative distribution of elements over an area of interest

- Displays quantitative composition variation across an area of interest.
- At every pixel in a SmartMap it calculates/corrects for:
  - Overlaps with other element lines
  - Variations in X-ray background
  - Pulse pile-up
  - Apparent concentration using standardless or standards based-methods
  - Material matrix (XPP matrix correction)

Standard mapping enables a qualitative assessment of the distribution of Fe over the region being analysed by correlating the bright areas with a greater concentration. However, QuantMap enables the visualisation of areas of higher concentration more easily, along with their associated wt% value (via the colour key). This also makes the direct comparison of individual maps more meaningful.

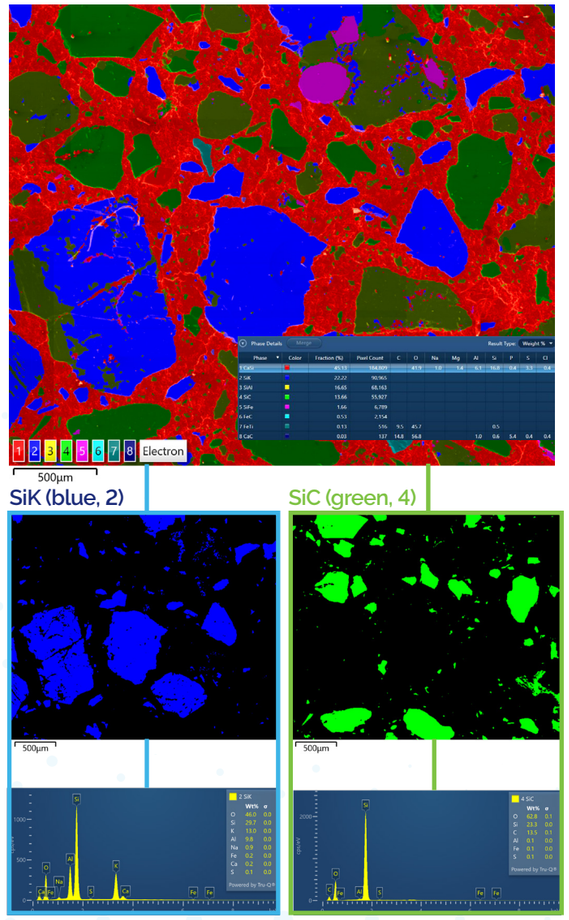


FE QuantMap

AutoPhaseMap

Automatically creates a map of the distribution of phases in a sample (during or after acquisition)

- Turns X-ray SmartMap data into Phase Map data in seconds
- Calculates and displays:
  - distribution and area fraction for each phase
  - spectrum and composition for each phase
- Finds phases for all size ranges, including nanomaterials
- Finds hidden phases, highlighting missing elements which are present in trace amounts



Two Individual phases SiK phase (blue) and SiC (green) with their associated spectrum.

AZtecLive® Expert

AZtecLiveEXP

Designed for users with more complex and challenging applications, who require the latest technology to deliver results, and to offer the largest number of tools to meet the needs of the widest range of applications.

TEMQuant for SEM

Analysis of STEM samples in the SEM TEM navigators and workflow for the collection, analysis and quantification of EDS data from thin lamellae in the SEM.

- High spatial resolution nanoanalysis in the SEM
- The ideal solution for the growing technique of 30-kV-STEM
- Enhance productivity and reduce TEM requirements by analysing thin samples in FIB- or FE-SEM
- Quantitative analysis using the Cliff Lorimer method with optional correction for X-ray absorption correction that copes with continuous sample drift

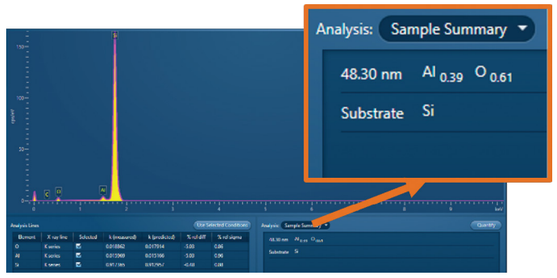
LayerProbeONE (With Spectrum Synthesis)

LayerProbeONE

Investigate the composition and thickness of coatings or single layer films on the surface of samples in the SEM Non-destructive, rapid measurement with the sample in-situ

- Determine the thickness of conductive coatings, such as carbon and gold, to optimise quantitative analysis
- Measure the composition of deposited films with thicknesses of 1 nm to several microns
- Investigate the formation of native oxides on metal surfaces
- Measure the thickness of thin lamellae during sample preparation in the FIB

Follow a dedicated workflow from determining the optimum analysis set-up, through to results validation

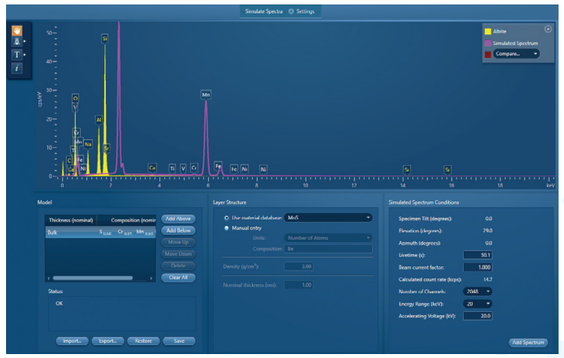


Thickness determination of an Al_2O_3 layer on a Si substrate

Spectrum Synthesis

As part of LayerProbeONE, spectra from bulk samples or single films on a substrate can be theoretically calculated and displayed, to help determine and optimise EDS collection settings

- Check the visibility of minor and trace element peaks
- Find the optimum accelerating voltage for analysis
- Compare your results with those from the expected composition



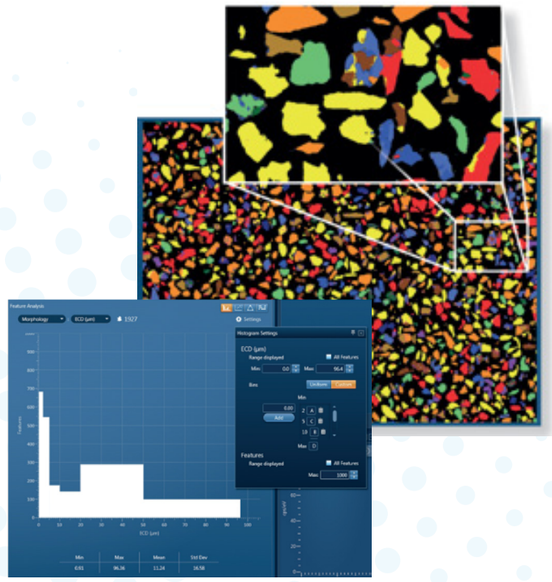
Synthesis of the expected spectra for the Al_2O_3 layer on Si with different acquisition conditions

AZtecFeature

A smart, fast and accurate particle/feature analysis platform which automates the acquisition of morphological and compositional (EDS) data from features to combine chemistry and morphology on a particle-by-particle basis. AZtecFeature enables comprehensive classification of features in rare particle searches and population scale characterisations

Common Applications:

- Airborne particulates
- Asbestos
- Bio markers
- Contaminant detection
- Drug powders
- Forensic geology
- Gunshot residue
- Hard disk drives
- Metal powders
- Minerals processing
- Non-metallic inclusions
- Rock thin sections

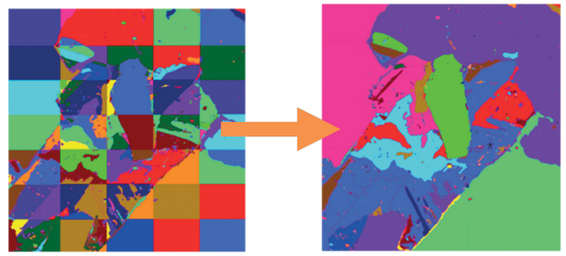


Optional Customised Application Recipes for the analysis of:

- Gunshot residue (GSR) - AZtecGSR
- Technical Cleanliness to VDA19 and ISO16232 -AZtecClean
- Non-metallic inclusions in Steel - AZtecSteel
- Battery Powders - AZtecBattery
- Additive Manufacturing Metal Powders - AZtecAM
- Asbestos on air filters - AZtecAsbestos
- Geological samples - AZtecGeo
- Mineral association/liberation - AZtecMineral

SMART

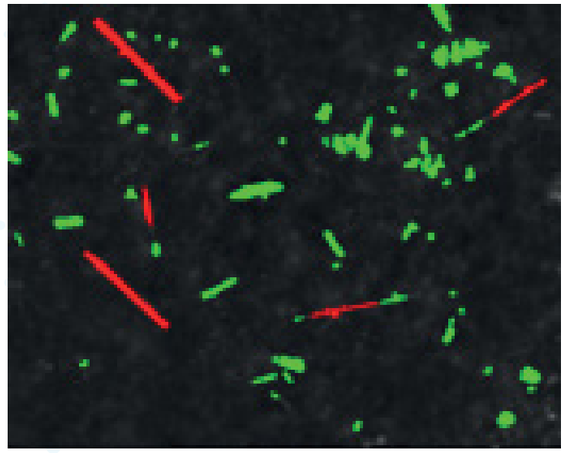
- Assisted particle detection/thresholding
- Reconstruct particles broken by field boundaries
- Assisted and intuitive classification approach
- Option to detect features via compositional mapping when BSE images have insufficient contrast



Reconstruction of features broken by field boundaries

FAST

- Analysis rates in excess of 120,000 particles per hour
- Acquires up to 200,000 particles per area
- Multi-stage acquisition process filters acquisitions by morphology and/or composition
- Batch management of multiple runs
- Comprehensive run termination options mean no more data is acquired than needed.



Saves time by filtering features by morphology – only acquiring fibres

ACCURATE

- Uses AZtecLive's TruQ IQ algorithms for maximum confidence
- Two-stage imaging approach for enhanced particle location accuracy
- Search for rare particles and reacquire at higher detail

AZtec Packages Contents Table

Description	AZtecLiveLite	AZtecLiveSTD	AZtecLiveADV	AZtecLiveEXP
Analyser Navigator/Step (Spectrum Acquisition)	✓	✓	✓	✓
Point&ID Navigator/Step (Spectrum Acquisition)	✓	✓	✓	✓
Mapping Navigator/Step (Map Acquisition) datafile	✓	✓	✓	✓
Linescan Navigator/Step (LineScan Acquisition)	✓	✓	✓	✓
Tru-Q (Unique technology ensures that elements are automatically identified and quantified to new levels of accuracy)	✓	✓	✓	✓
FLS (Robust spectrum processing that works in all situations with no need for any background fitting adjustment)	✓	✓	✓	✓
XPP (Matrix correction with proven accuracy beyond that possible with ZAF or Phi-Rho-Z)	✓	✓	✓	✓
QCAL (Complete detector and hardware characteri-sation for true standardless analysis)	✓	✓	✓	✓
PPC (Automatic correction for pulse pile-up at high count rate, making accurate quant at 200,000cps a reality)	✓	✓	✓	✓
SmartMap (Stores full spectrum in every pixel point on a Map)	✓	✓	✓	✓
Spectrum Examiner (enables small phases to be detected in a SmartMap)	✓	✓	✓	✓
MiniQuant Viewer (Live view of quantitative data in numeric and graphical form)	✓	✓	✓	✓
Guided Mode (WorkFlow approach to analysis)	✓	✓	✓	✓
User Profiles (Stores all parameters required to reproduces an analysis)	✓	✓	✓	✓
Step Notes (Helpful note to guide the users on what to do - editible so that user SOPs can be imported)	✓	✓	✓	✓
Language Variants (languages can be switched easily for multi-user environments)	11	11	11	11
Fitted Spectrum (Overlay to aid users in determining what elements are present in their sample)	✓	✓	✓	✓
AZtecLiveStep (Live Chemical Imaging)	✓	✓	✓	✓
AZtec Standardisation Manager (Input users stand-ards) navigate in microscope) – also works on SEM images	✓	✓	✓	✓
Report Template Editor (Create your own report templates)	✓	✓	✓	✓
AZtecLiveTrace (Records locations visited during 'Live' analysis)	Option	✓	✓	✓
Image Registration and Stage Move Tool (Use any sample image to navigate in the SEM by taking control of SEM stage)	Option	✓	✓	✓
Custom Mode (Configurable user interface)	Option	✓	✓	✓

Description	AZtecLiveLite	AZtecLiveSTD	AZtecLiveADV	AZtecLiveEXP
AZtec AutoLayer (Automatically combine electron image and X-ray maps in a single image)	Option	✓	✓	✓
AZtec TruMap (Overlap and background corrected mapping)	Option	✓	✓	✓
AZtec AutoLock (Drift correction for AZtecLive Software)	Option	Option	✓	✓
AZtec AutoPhaseMap (Automatic phase analysis)	Option	Option	✓	✓
AZtec QuantMap (Quantitative Mapping and Linescanning)	Option	Option	✓	✓
AZtec Large Area Mapping (AZtec Auto W10 PC Recommended)	Option	Option	✓	✓
AZtec MapQueue (Automated point map acquisitions)	Option	Option	✓	✓
AZtecMatch	Option	Option	✓	✓
AZtec TEM Quant for SEM (TEM Analyser Navigator)	Option	Option	Option	✓
AZtec LayerProbeONE (Investigate the composition and thickness of a coating or single layer film on the surface of samples in the SEM.)	Option	Option	Option	✓
Spectrum Synthesis (Included with LayerProbeONE enables spectra from bulk samples or single films on a substrate to be theoretically calculated and displayed, to help determine and optimise EDS collection settings)	Option	Option	Option	✓
AZtec Feature Analysis (Automated Particle Analysis software)	Option	Option	Option	✓
AZtec Steel (automated analysis and classification of non-metallic inclusions in steel - Requires MS Office and Feature)	Option	Option	Option	Option
AZtec GSR Package (Gun Shot Residue analysis – requires AZtec Feature)	Option	Option	Option	Option
AZtec Clean (Measure the Technical cleanliness of components to industrial standards - requires AZtec Feature)	Option	Option	Option	Option
AZtec LayerProbe (calculates thicknesses and compositions of multi-layer structures)	Option	Option	Option	Option
AZtecLiveOne for AZtecLive (Adds AZtecLiveOne functionality to an AZtecLive installation)	Option	Option	Option	Option
AZtec Synergy (upgrade an existing EDS/EBSD system to a Synergy system)	Option	Option	Option	Option
Reporting	✓	✓	✓	✓
AZtecEDS W10 PC	✓	✓	✓	✕
AZtecEXP W10 PC	Option	Option	Option	✓
27" monitor	✓	✓	✓	✓

Order today

Need more information? At Oxford Instruments we are committed to finding the correct solution for you. With a dedicated team of technical advisors, we are able to offer you one-to-one guidance and technical support on all products.

To request more information please see: nano.oxinst.com/contact-us

Note
Oxford Instruments reserves the right to alter without notice the specification, design or conditions of supply of any product or service.
Original document in English

AZLP-BR-0326-R1

www.oxinst.com